



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003IA36B

**Title:** Veterinary antibiotics: Transport to and degradation in surface water

**Project Type:** Research

**Focus Categories:** Toxic Substances, Non Point Pollution, Water Quality

**Keywords:** antibiotics, veterinary, tylosin, manure, environmental fate

**Start Date:** 03/01/2003

**End Date:** 02/29/2004

**Federal Funds Requested:** \$12000.00

**Matching Funds:** \$31048.00

**Congressional District:** IA 4

**Principal Investigators:** Coats, Joel Robert (Iowa State University)

**Abstract:** Antibiotics have recently been identified as surface water contaminants. Tylosin is a veterinary antibiotic commonly used in swine production for growth promotion and disease prevention, and is among those recently detected in waters. Swine excrete this drug in urine and feces, and tylosin enters the environment via manure application. Little is known about the fate of tylosin in a manure-soil matrix. The proposed study will provide valuable data pertaining to the transportation of tylosin to surface water, and its subsequent degradation in such water. These data will provide insight on the degradability and mobility of tylosin residues in soil water as it leaches through soil toward tiles and eventually ditches, streams, and ponds. Tylosin in a manure slurry will be added to intact soil columns to determine leaching potential to surface or ground waters; it will also be added to surface water with and without aquatic plants to determine degradation rates in aquatic systems. Concentrations of parent compound and metabolites will also be evaluated in leachate and surface waters. These measurements will provide information on the leaching potential of tylosin and the possibility for mitigating contamination of surface water through the use of submerged aquatic plants through phytoremediation. We anticipate that our results will be valuable in the future for risk assessments of antibiotics in the environment.

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*[U.S. Department of the Interior](#), [U.S. Geological Survey](#)*

*Maintain: [Schefter@usgs.gov](mailto:Schefter@usgs.gov)*

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